REMARKS

By this amendment, claims 1 and 4-23 are pending in the application.

Claim 8 is being amended to include an element from claim 1, namely, adjusting a pressure of the cleaning gas to maintain the electron beam current at a substantially constant value. This amendment is fully supported by the originally filed Specification and original claims and adds no new matter.

Claims 1 and 16 are being amended to cosmetically improve the claims without affecting the scope of the claims; and thus, the scope of the doctrine of equivalents applied to the claim should not be limited under Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 2002 Lexis 3818 (May 28, 2002).

Entry of the amendments and reconsideration of the present case is respectfully requested.

Rejections Under 35 U.S.C. § 102

1. The Examiner rejected claims 1, 4-5, 8-10 and 13-15 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,981,960 issued to Ooaeh et al. ("Ooaeh et al.").

For a cited reference to anticipate a claim of a pending application, the cited reference must disclose each and every element within the examined claim:

> Invalidity for anticipation requires that all of the elements and limitations of the claim are found within a single prior art reference....There must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention. Scripps Clinic & Research Found. V. Genentech Inc., 18 USPQ 2d 1001, 1010 (Fed. Cir. 1991).

Claim 1

Claim 1 is to a method of cleaning a chamber of an electron beam treatment apparatus. The method comprises: (a) generating an electron beam current though a cleaning gas to energize the cleaning gas in the chamber of the electron beam treatment apparatus; (b) monitoring an electron beam current; (c) adjusting a pressure of the cleaning gas to maintain the electron beam current at a substantially constant value; and (d) stopping the flow of cleaning gas when the cleaning gas pressure becomes substantially constant for a predetermined length of time.

Ooaeh et al. does not teach adjusting a pressure of the cleaning gas to maintain the electron beam current at a substantially constant value, as in claim 1. Instead, Ooaeh et al. teaches:

> ...setting the ozone gas concentration in the chamber so that the concentration downstream along the charged particle beam is higher than the concentration upstream along the charged particle beam...the concentration of ozone gas in the chamber in an area where the current of the charged beam is small is higher than in an area where the current of the charged particle beam is large...[a]s a result, since the concentration of ozone gas is low in the upstream chamber where the current of the charged particle beam is large, damage to the components caused by oxidation of active oxygen can be prevented, and an adequate amount of ozone gas for self-cleaning can be supplied downstream, where the current of the charged particle beam is small. (Ooaeh et al., Col 3, lines 31-48.)

In other words, Ooaeh et al. teaches that the current of the charged particle beam is different based upon the location within the chamber, for example, upstream or downstream. For instance, Ooaeh et al. teaches setting the ozone gas concentration to be higher where the current of the charged particle beam is lower and setting the ozone gas concentration lower where the current of the beam is higher, in order to avoid oxidation of chamber components while still providing an adequate amount of ozone for

self cleaning. Therefore, unlike claim 1, Ooaeh et al. does not teach maintaining the electron beam current at a substantially constant value nor does it teach adjusting the pressure of the cleaning gas to do so.

While the Examiner states that Ooaeh et al. teaches adjusting a pressure of the cleaning gas to maintain the electron beam current at a substantially constant value in Col. 4, lines 51-66, Applicant respectfully disagrees. This section teaches:

> The ion pump P1 can not form a vacuum by evacuating the air in chamber 1 with air pressure, but can maintain the evacuated condition of the chamber 1 once the molecular turbo pump P2 has produced a vacuum to a degree. Although the principle of the ion pump P1 is well known and is not therefore described in detail, in short, an ionized metalic material, such as titanium, is used in the ion pump P1 to absorb gas in order to maintain an evacuated condition.
>
> The principle of the electron beam exposure apparatus is as follows. The chambers of the lens barrel are evacuated to obtain a high vacuum of, for example, $1x10^{-5}$ Torr (about $1x10^{-3}$ Pa), and an electron beam is emitted by the electron gun 14. The emitted electron beam is aligned along the axis, and is shaped to provide a predetermined rectangular beam by the first slit 15. (Ooaeh et al., Col. 4, lines 51-66.)

There is no mention of maintaining the electron beam current at a substantially constant value nor does this section teach adjusting the pressure of the gas to accomplish this. Rather, it teaches that a turbo pump is used to create a vacuum-like atmosphere and an ion pump is used to help maintain such a state, in which an electron beam is then emitted. Further, as discussed above, the current of the beam is different depending on the location within the chamber of the segment of the beam that is being examined.

For at least these reasons, claim 1 and the claims dependent therefrom are not anticipated by Ooaeh et al. because Ooaeh et al. does not teach each and every element of claim 1.

Claim 8

Amended claim 8 recites, inter alia, adjusting a pressure of the cleaning gas to maintain the electron beam current at a substantially constant value. This is not taught by Ooaeh et al. for at least the reasons discussed above. Instead, as discussed above, Ooaeh et al. teaches emitting a charged particle beam in a vacuum-like atmosphere; maintaining that vacuum-like atmosphere; and increasing ozone concentration in areas of the chamber where the beam current is low, while decreasing the ozone concentration in areas where the beam current is high, to prevent oxidation of the chamber components while still providing means to clean the surfaces of such components.

For at least these reasons, claim 8 and the claims dependent therefrom are not anticipated by Ooaeh et al. because Ooaeh et al. does not teach each and every element of claim 8.

Rejections Under 35 U.S.C. § 103

1. The Examiner rejected claims 16-18 and 21-23 under 35 U.S.C. § 103(a) as being unpatentable over Ooaeh et al.

An obviousness rejection requires that the cited reference teach or suggest all of the elements of the claim in question:

> To establish obviousness, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Claim 16

Independent claim 16 recites, inter alia, adjusting a pressure of the cleaning gas to maintain the electron beam current at a substantially constant value, which Ooaeh et al. neither teaches nor suggests for at least the reasons presented above. Instead, Ooaeh et al. teaches that in the region where the charged particle beam happens to be low, ozone concentration is increased and in the region where the current is high, the concentration of ozone is decreased. Ooaeh et al. does not teach maintaining the electron beam current at a substantially constant value nor does it teach adjusting the pressure of the cleaning gas to do so.

Thus, as Ooaeh et al. does not teach or suggest all of the elements of claim 16, claim 16 and the claims dependent therefrom, including claim 23, are patentable over Ooaeh et al.

Claims 21 and 22

Claim 21 depends from independent claim 1 and claim 22 depends from independent claim 8. Independent claims 1 and 8 are patentable over Ooaeh et al. because each claim recites, inter alia, adjusting a pressure of the cleaning gas to maintain the electron beam current at a substantially constant value, which is neither taught or suggested by Ooaeh et al., as discussed above.

Based upon the arguments presented above, Applicant respectfully requests the allowance of these claims.

2. The Examiner rejected claims 6, 7, 11-12 and 19-20 under 35 U.S.C. § 103(a) as being unpatentable over Ooaeh et al. in view of U.S. Patent No. 5,539,211 issued to Ohtoshi et al. ("Ohtoshi et al.").

Claim 6 and 7

Claim 6 depends from claim 1 and claim 7 depends from claim 6, which depends from claim 1. As discussed above, Ooaeh et al. does not teach or suggest adjusting a pressure of the cleaning gas to maintain the electron beam current at a substantially constant value, as recited in claim 1.

However, Ohtoshi et al. fails to make up for the deficiencies of Ooaeh et al. because Ohtoshi et al. does not teach or suggest the claimed process step of adjusting a pressure of the cleaning gas to maintain the electron beam current at a substantially constant value. Instead, Ohtoshi et al. teaches that microwave activated plasma species are formed in a plasma generation portion 2 which is separate from and outside the electron beam column 1. Ohtoshi et al. further teaches:

> ... the inside of the column 1 being kept depressurized at a pressure of 10^{-7} Torr, plasma (active species) of 10^{-2} to several 10 Torr can be made flow [sic], so that a time for recovering the depressurized pressure after cleaning can be greatly shortened. (Ohtoshi et al., Col. 11 line 50 to col. 12, line 9.)

Thus, Ohtoshi et al. teaches that it is desirable to maintain a low pressure of 10^{-7} Torr in electron beam column 1 to allow the microwave activated plasma which is externally formed at a higher pressure of 10^{-2} to several 10 Torr in the plasma generating portion 2, to flow into the lower pressure column 1. Importantly, Ohtoshi et al. teaches setting a constant pressure in the electron beam column, namely 10^{-7} Torr, and thus *teaches away* from "adjusting a pressure of the cleaning gas" as recited in claim 1. Moreover, Ohtoshi et al. does not disclose adjusting a pressure of the cleaning gas to maintain the electron beam current at a substantially constant value, as claimed in claim 1.

Thus, for at least these reasons, the combination of Ooaeh et al. and Ohtoshi et al. does not render obvious claim 1 or the claims dependent therefrom.

Claims 11-12

Claim 11 depends from independent claim 8 and claim 12 depends from claim 11, which depends from claim 8. Claim 8 recites, inter alia, adjusting a pressure of the cleaning gas to maintain the electron beam current at a substantially constant value, which Ooaeh et al. neither teaches nor suggests as discussed above. In addition, Ohtoshi et al. fails to make up for the deficiencies of Ooaeh et al. as also discussed above. Namely, Ohtoshi et al. teaches maintaining a particular constant pressure during the cleaning process as opposed to adjusting the pressure of the gas. In fact, Ohtoshi et al. teaches away from the claimed process step of adjusting the pressure of the cleaning gas by teaching that a constant partial pressure of a gas is needed. Further, Ohtoshi et al. does not teach or suggest maintaining a substantially constant beam current by adjusting the pressure of the gas.

Therefore, for at least these reasons, the combination of Ooaeh et al. and Ohtoshi et al. does not render obvious claim 8 or the claims dependent therefrom.

Claims 19 and 20

Claim 19 depends from claim 16 and claim 20 depends from claim 19, which depends from claim 16. As discussed above, Ooaeh et al. does not teach or suggest adjusting a pressure of the cleaning gas to maintain the electron beam current at a substantially constant value, as recited in claim 16. As also discussed above, Ohtoshi et al. fails to make up for the deficiencies of Ooaeh et al. In particular, Ohtoshi et al. teaches away from the claimed process step of adjusting the pressure of the cleaning gas by teaching that a constant partial pressure of a gas is needed.

Further, Ohtoshi et al. does not teach maintaining a substantially constant beam current by adjusting the pressure of the gas.

Hence, the combination of Ooaeh et al. and Ohtoshi et al. does not render obvious claim 16 or the claims dependent therefrom.

For at least the foregoing reasons, allowance of the present claims is respectfully requested. Should the Examiner have any questions regarding the above amendments or remarks, the Examiner is requested to telephone Applicant's representative at the number listed below.

Respectfully submitted,
JANAH & ASSOCIATES, P.C.

Date: December 15th, 2006

By: _____

Ashok Janah
Reg. No. 37,487

Please direct all telephone calls to: Ashok K. Janah at (415) 538-1555.

Please send all correspondence to:

Janah and Associates, PC
650 Delancey St, Suite 106
San Francisco, CA 94107

AJ/ms